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SCHOOL AND SOCIETY

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CONTENTS

Inaugural Address of the Chancellor of New York University: HARRY WOODBURN CHASE 793

Invention and School Arithmetic: H. G. GOOD 796

Educational Events:
A University City for Rome; Summer School Enrolment and Cost; The Harvard University Summer School; The Institute of Public Affairs at the University of Virginia; Conference of Educational Workers in Correctional Institutions; Honorary Degrees Conferred by New York University; The Retirement of President Ames of the Johns Hopkins University; The Eighth President of Western Reserve University 802

Educational Notes and News 806

Discussion:
What Correlation is There between Education and Vocation?: W. H. TIMBIE. *President Roosevelt's Vocabulary:* RICHARD S. SCHULTZ 810

Special Correspondence:
Education and Culture Contacts: CHARLES T. LORAM. *Colorado High School Students as a Model House of Representatives:* LASHLEY GREY HARVEY 814

Quotations:
Engineering as a Fine Art 817

Reports:
A New Conception of Accrediting Standards: H. M. DOUTT. *Testimony before the Senate Committee Investigating Crime* 818

Educational Research and Statistics:
Special Classes for Physically and Mentally Handicapped Pupils: KENNETH NILSON 821

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INAUGURAL ADDRESS OF THE CHANCELLOR OF NEW YORK UNIVERSITY[1]

By Dr. HARRY WOODBURN CHASE

No man has ever had a more gracious welcome to a university post than that which you have given me. I do not refer alone to these formal ceremonies, deeply as I appreciate what has been said on this platform. Behind them lies the fact that we have known each other, that we have worked together, for a full year. My distinguished predecessor in this office, whom we welcome here to-day so heartily, has spoken of the unfailing support of those concerned with the university. To me these are no empty words. To the council and to the faculty of New York University, to her alumni and students, I should like to make public acknowledgment of the fine cooperation with which you have worked with me during these months.

A deep sense of the promise and power of this institution has been growing in my mind. As it swings into the second century of its existence, may it maintain that spirit of fearless pioneering in which it was conceived; that courage which has illustrated its whole career and that sense of responsibility to community and nation which has given character to its work.

I accept, therefore, this charge which you have laid upon me, as a challenge which affords a most significant opportunity. To this task I pledge you my unremitting efforts.

[1] Delivered at the one hundred and second commencement on June 13.

There is in the world about us to-day such a clamor of dissenting voices, such a fundamental confusion and conflict of ideas and ideals, that the task of universities is no simple one. The background against which their operations are set is not merely one of economic depression. Tragic as the effects of the depression have been and are, large as they loom in the center of the picture to-day, it is becoming more and more apparent that the fundamental struggle in which humanity is engaged is not merely one of overcoming material inadequacies and dislocations. It involves, far more importantly for the future, a series of conflicting and widely differing attempts to formulate a way of life for humanity itself. We are witnessing, if you please, a conflict of philosophies, and the outcome of that conflict has immense importance for human destiny.

I can perhaps best illustrate what I mean by reminding you of a set of attitudes and ideas that, a generation ago, seemed destined to win their way, with constantly diminishing opposition, throughout the western world. These were identified with the world-wide movement toward democracy and liberalism that had come increasingly to captivate the minds of men.

John Morley has an illuminating page in his "Recollections" in which he attempts to define the inner essence of nineteenth century liberalism. Back of all its expres-

sions, he points out, lay an attitude of mind that rooted in a sense of the importance, the dignity, the worth, of the individual. He was the center of the picture. Society existed for him, not he for society. His gradually growing freedom, the increased sense of the importance of his life as a life, higher standards of comfort and a growing variety of satisfactions that were within the reach of more and more men and women over large areas of the earth—these things were important in themselves, as ends that should be striven for. But they were important for other reasons. For, as most of us read history a generation ago, it was with a deep belief, a rather blind belief, if you please, in the reality of progress. We were progress-conscious. I remember once being rather startled by a brilliant volume that pointed out that the very conception of progress had only been in men's minds for a few generations. We believed in it, and we thought that we found in history ample warrant for believing that the possibility of progress itself depended on an attitude that had regard for the individual. As a generation that knew a little about biology, we were impressed by the importance of variations in the evolution process, and we extended the analogy to human society.

Freedom, in other words, was not only a satisfaction to the individual. It was a condition of the advance of civilization. And, because we believed in these things, we believed in the importance of popular education, as an instrument both for developing the capacities of the individual and for maintaining the continuity of human progress.

You and I are to-day citizens of a world in which this whole philosophy has been thrust out of the mind of nation after nation. The movement toward democracy and toward human freedom, toward that sense of the dignity and worth of the individual to which Morley referred, has not only been definitely checked, it has suffered catastrophic reverses. State after state has come to seek efficiency and security through subordination and regimentation of the individual to centralized and despotic authority. Education in such states has become frankly a means of indoctrination and propaganda. The individual life finds itself constrained by a ceaseless external discipline. The rights of minorities are suppressed. Freedom of discussion, the right to differ, the right to plan one's own life—these things cease to exist for millions upon millions of the earth's population.

This is not merely a question of what has happened to the liberalism of a generation ago. It is more significant even than that. We seem rather to be witnessing the ebbing of a tide of human thought that had been flowing more and more strongly since the Renaissance—a tide that was washing away, one by one, the obstacles that circumscribed the development of individual men and women. This attitude appeared in many forms. Intellectually, it meant the right to free inquiry into all things. Religiously, it appeared as the right to choose one's own faith. As a political theory, it meant what we mean by democracy, under whatever governmental form it appeared. Socially and economically, it expressed itself in wider provision for individual opportunities, in an ampler life for more and more people and in the development of universal education.

But I need not go on. That attitude, it is clear, is now on the defensive. It is scarcely satisfying to me to reply that all this has to do with what is happening in Europe, and that this is America. America, after all, has not been guaranteed eternal democracy by divine fiat. There are no international barriers against the contagion of ideas. It is not impossible to regiment the American people. Great sections of them have been regimented more than

once in our history. And when we are regimented, we can be violent and cruel.

The history of what happened to the South during reconstruction, the course of the Ku Klux movement a decade ago, are two reminders of that fact. The problem is one of destiny for us as well as for our neighbors. It is whether we can find a way of life that is both free and workable, whether the intricacies of our modern social and economic order are so beyond the power of free men to deal with that we must sacrifice all the significance of the individual life to maintain a going social order. Must all this striving for human progress end in such dreary futility as Aldous Huxley has portrayed with devastating irony in "This Brave New World"?

Do not misunderstand me. All of us are aware to-day that we can not make a twentieth century society function by following in detail the eighteenth century formulas of Jefferson and of Adam Smith. The problem is far less simple than it appeared even twenty years ago. But at the heart of it lies the significant choice: Shall we set out arbitrarily to create a social order and then indoctrinate and drive individuals into subordination to it, or shall we center our efforts on the making of men and women who are themselves competent and disposed, as free agents, to do what should be done?

For myself, I confess, there seems but one possible answer. Civilization and human progress must depend in the long run, not on dictatorship, not on social and economic prescriptions, not even on laws, but on the quality of men and women.

John Milton said long ago that the first step in the decay of a commonwealth took place "when men cease to do according to the inward and uncompelled actions of virtue, caring only to live by the outward constraint of law." That is the point. It makes a vast difference whether we seek to locate the springs of action outside or inside the individual. Discipline we must have wherever there is freedom, but there is no real substitute for inner discipline and self-control.

These things are not only of importance to the individual himself. They have to do with the future of the human race. There is perhaps no lesson which history teaches more plainly than that pressure toward conformity, on the one hand, and the advance of civilization on the other, stand in inverse ratio to each other. Is it possible that we should so soon forget, for example, how slowly the beginnings of free inquiry into nature were able to make themselves felt in a world that believed that the only sound science was that which conformed to the teachings of Aristotle? Regimentation in any area involves a philosophy which is the denial of the basic conditions of progress. Civilization advances in proportion as free inquiry is possible, free discussion and the clash of ideas are permitted, minority opinions can be uttered without fear, and the individual life is regarded as a thing of dignity and importance in itself.

Universities are the organized instruments of society for the advancement and the transmission of knowledge. Because of this, what they do or leave undone is of immense significance for the outcome of this conflict. This is clear enough to those who believe in regimentation. In such states, freedom of learning and teaching, like freedom of the press, ceases to exist. For those who believe in human freedom, on the contrary, there can be no more important task than that of safeguarding the freedom of institutions of learning. This is a primary condition of the advance of civilization in the modern world.

It is not the business of universities to be instruments of indoctrination and propaganda. It is not their mission, on the one hand, to evolve theoretical Utopias and then to condition people for participation

in them. Nor is it, on the other hand, their mission to become apologists for the dogma that whatever is, is right. Their concern is rather to open and develop the minds of men and women; to give them understanding, knowledge of the truth, appreciation of the processes by which it is arrived at, so that, as open-minded, informed, free people, they may look at and take part in life as intelligent, reasonable human beings. In proportion as universities can really succeed in accomplishing these things over the years, the question of finding a free and workable way of life is one which will be solved in the only way in which it can possibly be solved in the long run, namely, through sufficiently wide-spread knowledge and competence to make its solution possible through the methods to which free peoples are accustomed.

I have spoken of the necessity for freedom in our universities. It is equally important that universities must not forget the obligation which that freedom implies. In a word, that obligation seems to me to be that of maintaining the scientific temper. Especially, at such a time, should that obligation rest heavily upon those within the fields of the social sciences. In these fields it is not yet always easily possible to dislocate knowledge from dogma, to maintain that detachment from personal and temperamental preferences and dislikes which is the essence of the scientific point of view. I do not mean that in other fields of science these complications are always absent; I do mean that in the fields of social science they are especially insidious, and the objective, impartial attitude especially difficult to maintain. If the study of society is a science, then it should be carried on from the scientific point of view.

Universities, in a word, can properly be neither apologists nor agencies of propaganda. Their concern is with knowledge, and with the illumination that it brings to men. So, and so only, do they, in the end, best serve a free society because they strive to develop freely inquiring and adequately informed human beings.

INVENTION AND SCHOOL ARITHMETIC

By Professor H. G. GOOD
THE OHIO STATE UNIVERSITY

EVEN animals seem to have a number sense. The bee builds her cell in the form of a hexagonal prism, although she may not know what a regular hexagon is nor that its side is equal to its radius. If only she would take the trouble to develop an articulate language, preferably the English, we might be able to speak with more exactness of what she "knows." And we understand but little more of the origin of number in the human race. Perhaps it arose from the rhythmical nature of organic and conscious processes; perhaps, as James Ward thinks, from the intuitive perception of small groups as patterns.[1] "The herdsman could recognize that one of his sheep was missing without being able to count his flock, and even his dog could do the same, the needs of the two in this respect being quite on a par."[2]

Leaving the question of origins and coming to matters of fact, early counting for practical purposes was of concrete things, and consisted first of all in setting up a one-to-one correspondence between the objects and the selected counters, as the fingers, pebbles or tallies. This part of the counting process can be accomplished by

[1] "Mind," xxix: 137.

[2] David Eugene Smith, "History of Mathematics," 2 vols., Boston, Ginn and Company, I: 6, 1923.

observing that there are as many persons as chairs when all chairs are occupied and no one is standing; or, in a serial manner, by laying one cover for John, another for Ruth and so on until there is one for each of the family and guests. In these operations, without using either tallies or number-names, we yet establish the numerical equality of two collections. The second half of the process of counting consists of the use of the successive members of an ordered series with which to set up the correspondence; and the most convenient ordered series is that of the number-words or numerals. The former of these steps may have been taken before the development of language; the latter presupposes the invention of a numeral series and a certain capacity for abstract thought. All the rest of arithmetic is based upon and most of it is evolved out of the simple process of counting.

Counting is itself a kind of measurement, for by finding "how many" we secure an estimate of "how much"; but it is directly applicable only to commodities composed of convenient, fairly uniform, discrete units, to herds of cattle but not to land or even to wheat. Eggs are regularly sold by number; but in the case of land or gasolene, standard units are selected and "applied" to the commodity. When the applications are counted the measure is expressed as a number. These two inventions, counting and measuring, are the bases of that practical use of number from which much of school arithmetic has grown.

The need to measure with exactness has led to many inventions which have had the greatest influence both upon arithmetic and upon that larger complex which we call civilization. The measurement of time is one of the most urgent needs of man in society where cooperation is expected. Nature provides an obvious time-unit and even savages count the days before a feast by means of knots or beads on a string. Such a crude calendar is used by removing a bead each day until the expected event is to occur. The making of a real calendar depends upon the determination of the year, which is an astronomical problem. Egypt in 4241 B. C. introduced a civil calendar of 365 days; and this, if history means the record of datable happenings, is the beginning of history, for this is, so far, the oldest dated event.[3] Perhaps nothing can give so sharp a contrast between civilization and its absence as the fact that to many savages a delay of only a day or two is acceptable performance. In other measurements the ancient culture peoples were even more successful. The engineers who built the Great Pyramid about 2900 B. C. were in error by less than two thirds of an inch in a base line of 765 feet and deviated from a right angle at the corners by only twelve seconds.[4]

From early times commerce was married to arithmetic; and the Sumerian tablets of 2800 B. C. contain accounts, bills, receipts and other business "papers." The invention of the coinage about 700 B. C. was of importance to business and in the collection of taxes also to politics. But we need not pursue these topics, since we merely wish to remark that arithmetic is not only itself an invention but is closely related to other inventions in commerce, politics, the arts and the whole range of civilization.

Another set of facts would lead one to conclude that arithmetic as a racial achievement has been developed not only through practical demands but also through mysticism and through theoretical and scientific inquiries. In a previous paper on "Invention and the Map"[5] it was

[3] J. H. Breasted, "Ancient Times, a History of the Early World," p. 45. Boston, Ginn and Company, 1916.

[4] Smith, *op. cit.*, I: 43.

[5] SCHOOL AND SOCIETY, XXXV: 583–588, April 30, 1932.

shown that philosophy and exploration cooperated in producing the general conceptions and the exact knowledge of the earth which are necessary for accurate mapping. Arithmetic also has this dual ancestry. It, also, was created by philosophers and scientists on the one hand; and on the other, by common men seeking answers to their everyday questions: How many? How far? What time of day? Although painfully acquired by the race, this mathematics may be simple enough; and indeed its social usefulness is directly proportional to its simplicity. To be useful it must be widely disseminated; and to be widely disseminated it must be simple.

We have referred to the probable connection between counting and the rhythms of nature, inorganic and organic. Primitive men and the older culture-peoples attached magical virtues to seven or ten or the swastika and to other selected numbers or forms, whence number-lore or numerology. The Chinese investigated the mysteries of the magic square.[6] Among the Hebrews the "science" of numbers was called *Gematria*. Like the Greeks they used the letters of the alphabet to represent numbers, and therefore it was possible to sum up the "values" of the names of persons. To their Christian successors "Nero" equalled 666, "the number of the beast." The Greeks derived the number of an animal, as a horse, from a geometrical outline of its form with dots.[7] This practise may be compared with that of finding the shapes of animals in the constellations. We still retain in our common arithmetic from these excursions into mysticism such words as "figure"; and "square" and "cubic" as applied to numbers. Pythagoras and his followers developed an extensive theory of odd, even, perfect, triangular and other numbers. This is the actual origin of number theory, an important branch of pure mathematics. Euclid and Nicomachus are the main sources of our knowledge of Greek number theory. Through compends ascribed to Boethius and Bede this theory was introduced into the schools. Bede also included work on the *computus* or the calculation of the church calendar. And this was the arithmetic taught in the medieval schools and universities and continued far into the Renaissance. It was intended for scholars and the clergy, not for artisans or merchants, was of course in Latin and contained little of computation.

Practical arithmetic followed a different line of development. Its fate was very literally in the hands of the common people, for it was carried on by a finger symbolism, a device made necessary by the lack of a convenient number system, by the illiteracy of the people and by the fact that trade was carried on between peoples of different races. The finger-symbolism used in bargaining was fairly independent of spoken language.[8] For number records they used physical devices, such as notches on a stick or knots on a string. Examples are the quipus of the Incas and the tally-sticks which were used by the Bank of England from a time when many of its clients were illiterate down to 1826.[9]

From early times, calculation was most systematically carried on by means of the abacus. It was used in the East, including China, in Greece, in Rome and, as Capella shows, was familiar to western Europe as

[6] Vera Sanford, "A Short History of Mathematics," p. 4. Boston, Houghton Mifflin Company, 1930.

[7] Louis Charles Karpinski, "The History of Arithmetic," p. 18. Chicago, Rand, McNally and Co., 1923.

[8] David Eugene Smith, "Rara Arithmetica . . .", illustrations of finger symbolism, pp. 57, 138. Boston, Ginn and Company, 1901.

[9] Charles Dickens ridiculed this system in an address in 1855 on "Administrative Reform." The address may be found in the "National Library Edition" of Dickens, xix: 463 *ff.*

early as the fifth century. Pebbles or calculi were used as counters in early times, whence our word "calculate." Minted *jettons* or casting-counters of bronze, silver or gold, many of them stamped with elaborate designs,[10] were used later, and from the manner of placing these upon the lines of the abacus we have the phrase, "casting accounts." Long after the Arabic numerals came into use, this manual arithmetic was still practised, partly from old custom and partly because it could be used by the illiterate. Recorde's seventeenth century text refers to the ignorant as "those that can but cast with counters," and not reckon with the pen in Arabic characters. Many of the books, including this one, taught both methods. Although the manual arithmetic was not a part of the classical education of that time, yet a school book dialogue of the early sixteenth century begins as follows:

> Is there any Body here that understands Arithmetick? For what? To cast up exactly how many Grammarians there are of us. That may be done without a counting-table, we may count upon our Fingers.[11]

As a means of saving labor the Hindu-Arabic numerals are one of the great inventions of the world. The principle of position or place-value and the use of the zero are its essential features. The idea of place-value occurred to several peoples, the Babylonians, the Hebrews, the Mayas. And the Mayas even had a symbol for zero, but they do not seem to have made much use of it in calculation.[12] The fruitful use of these inventions, which like the alphabet are now familiar to every one and are therefore by almost every one dismissed as unworthy of attention, was made by the Hindus. The Hindu numerals reached Bagdad, where about 800 A. D. an Arab scholar, al-Khowarizmi, wrote an arithmetic employing them.[13] From his name came the word *algorism*, which was widely used to indicate the new form of calculating.

In the twelfth century the arithmetic of al-Khowarizmi was translated into Latin by various scholars who had studied in Spain. But the first European to prepare a full, independent and practical arithmetic using the new instrument was Leonardo Fibonacci of Pisa (1202), "the greatest and most productive mathematician of all the Middle Ages."[14] And a whole row of Latin algorismi date from the fourteenth and fifteenth centuries.

In the history of arithmetic as of letters the Renaissance begins a new period; and the results were as original. The arithmetics of the Renaissance were practical, mercantile works for the counting-house and for the Rechenmeister's practical school. The line-abacus survived for a time, but gradually the new algorism with Hindu-Arabic numerals won the day. The invention of printing spread the new instrument in all quarters. It is to be noticed particularly that as it was developed not by scholars but by practical men so it was also spread first and most widely among the common people; and that it forms a striking exception to Sir Henry Maine's dictum —"Except the blind forces of nature, nothing moves in this world which is not Greek in its origin."[15] Common arithmetic is neither a natural force nor a Greek creation.

The Renaissance in arithmetic as in let-

[10] F. P. Barnard, "The Casting-Counter and the Counting-Board," 353 pp. and 63 plates. Oxford, 1916. *Passim.*

[11] N. Bailey, "The Colloquies of Erasmus," 2 vols. London, 1878.

[12] Florian Cajori, "A History of Mathematical Notations," I: 4, 21, 43 *et passim.* 2 vols. Chicago, Open Court Publishing Company, 1928.

[13] Smith, "Rara Arithmetica," p. 7, but the question is not settled. See also Cajori, *op. cit.*, p. 46, and the references there given.

[14] Smith, "History of Mathematics," I: 214.

[15] Sir Henry Sumner Maine, "Village Communities . . ." [and other papers], p. 238. New York, Henry Holt and Company, 1876.

ters began in Italy, which was the great trading country of that time. The anonymous work of Treviso (1478) was the first to be printed. Pietro Borghi, six years later, printed at Venice an influential text. Neither of these writers would have anything to do with the Roman numerals, the medieval theory of numbers or the abacus; and both wrote in Italian. The natural course of trade was from the East to Italy, thence north through Nuremberg and Augsburg, then spreading out fan-wise to the Hanse towns, to France, Holland and England; and arithmetic followed the lines of traffic. The practical German text of Johann Widman (1489) explains the operations with integers and fractions, compound numbers and proportion and for the first time introduces into a printed book the signs of plus and minus. The rapidity of the spread of the new art, in contrast with its slow development from 800 to 1450, may be gauged from the fact that Professor Smith found in the Plimpton Library of New York 450 titles which were printed before 1600.

The early books tended to present the mechanical operations and a multitude of rules and special cases. Instruction was given in private reckoning schools which grew up to meet the demand or one might say the emergency. Ignored by church and state, each of which regarded them as accessories of business rather than schools in the usual sense, these institutions came to have a powerful influence in creating the common or people's school. Nuremberg had possibly fifty reckoning schools in the sixteenth century, and they flourished in all trade centers. The teachers organized themselves into a gild, admission to which was controlled by an apprenticeship and by an examination, both written and oral. One of the questions which has a historical interest reads: "What is a number? How is the 1 classified and what characteristics has the null?" Other questions dealt with vulgar fractions, simple proportion, progressions and roots.[16]

The next step in the history of arithmetic was in the direction of simpler processes, especially in multiplication and division. Stevin gave the first systematic discussion of decimal fractions in the sixteenth century, and Napier's invention of logarithms was published early in the seventeenth. The latter instrument, partly because of theoretical difficulties and partly because it is not needed before, is usually reserved for secondary education, although the use of the slide-rule can be taught to young children.

No one before Comenius understood, so well as he did, the function or realized so fully the importance of the common school. He announced the cardinal principle, often ascribed to Locke, that everything should as far as possible be presented first to the senses. In his "School of Infancy" he suggested this sensory beginning for arithmetic. His disciple, Andreas Reyher, attempted to apply these ideas in Saxe-Gotha, and the good duke of that little state, by Reyher's advice, provided for a thorough course in arithmetic. He even proposed that teachers should study the subject! Francke made similar beginnings. But in many elementary schools down through the eighteenth century the subject was not taught at all or taught incompetently by ciphering-book and other mechanical methods. Francke and the Württemberg ordinance of 1729 mention the blackboard, another invention of great importance in the teaching of arithmetic. Wall boards were not unknown in the Middle Ages, but were little used. In the United States the blackboard does not appear until the nineteenth century, and Barnard as late as 1839 says that its value

[16] C. Jänicke, "Geschichte der Methodik des Rechenunterrichts" in *Gesch. d. Meth. des deutschen Volksschulunterrichtes* (C. Kehr), III: 22. Gotha, 1888.

as a teaching instrument was little realized.

The transformation of the new arithmetic from a special, technical, purely commercial pursuit into a phase of general education and culture for all the children of the spreading common schools took place in the last two centuries. And a great struggle it was. It was in Germany that the pedagogy of the subject received the earliest and most systematic attention, and Christian Peschek (1676–1747) was one of its first exponents. How early progress was made in this field is shown by the Braunschweig ordinance of 1737, which in its arithmetic outline demanded the use of objects, small numbers, concrete questions, the explanation of multiplication as repeated additions and of division as repeated subtractions and in general the teaching not only of processes but also of reasons. Then came the Philanthropinists with new apparatus, wall-charts, flash-cards with patterns of dots, marked splints for the teaching of fractions and much else. Kant expressed the opinion that they were the only teachers of his day who had the freedom to develop new methods. They were the "Progressive" educators of the latter eighteenth century; and A. H. Niemeyer before the end of that century wrote—Pupils should find their own rules; skill and understanding go hand in hand; and both numbers and problems should be taken from actual life. All this before and without Pestalozzi. In arithmetic-methods, at least, Pestalozzi devised nothing valuable that was essentially new. He did help to stir the dry bones and to spread better methods already in use in favored schools. After him and partly because of him, arithmetic took its place beside reading as one of the essentials of a common school education.

The first attempt to introduce the Pestalozzian arithmetic into the United States was made by Joseph Neef, but neither his "Sketch of a Plan of Education Suited to a Free People" (1809) nor his various schools made any impression. Quite otherwise was it with Warren Colburn's "Intellectual Arithmetic" (1821). This popular little book introduced a vogue of mental arithmetic which lasted for more than fifty years.

After it came to be understood that arithmetic should be introduced through concrete objects, teachers and especially school equipment makers devised a large body of plastic and graphic materials to aid the young child. Many patents on such devices have been issued in the United States and a much larger number in Germany. As a matter of fact all the materials needed can be found in the schoolroom and the kitchen cupboard or can be made without much trouble in the school shop. One such implement may, however, be singled out for special mention. In 1813 soldiers returning from Napoleon's Russian campaign brought back to France a form of the abacus which they had picked up. This new-old device was introduced into the schools and has proved to be one of the simplest and most practical aids to an elementary notion of number. Thus, again, an old device on which the race cut its arithmetical eye-teeth has proved valuable in introducing the newest members of the race to our most highly developed concepts. Perhaps there is something in the culture-epoch theory, after all. But one does not need to go far for arithmetic equipment. To play a game equal sides may have to be chosen, the score has to be kept, materials may have to be measured or counted, a field may have to be laid out or a board constructed. It was from such situations that the race discovered its arithmetic; it is in such situations that the child rediscovers the same need. This genetic principle is also the source of motivation in the study, and both ideas have been stressed in the last generation by educational writers.

We have seen that Stevin gave a concise account of decimal fractions, an account which Karpinski says would hardly need to be changed in a single letter if it were written to-day.[17] So useful did decimal fractions prove themselves in calculation that a German teacher, Zöllner, spoke of the "sin of our forefathers in introducing common fractions at all." After all, quarters and thirds are convenient, and even with our decimal coinage it has been found desirable to mint half-dollars and quarter-dollars. Decimals and the metric system are the most recent additions to school arithmetic, and the latter is not even yet quite recognized as a necessary topic in English and American schools.

The latest step in the teaching of arithmetic was taken by Stone, Courtis, Thorndike and their confrères in the last twenty-five years. Of this work in the psychology of arithmetic and in the construction and use of scales and tests we have not space to speak now.

EDUCATIONAL EVENTS

A UNIVERSITY CITY FOR ROME

ACCORDING to the London *Times*, in the program of activities planned by Fascism in support of culture and learning the construction of a great university city in Rome occupies a leading place.

On November 4, 1930, a decree of the head of the Italian Government gave over the property of the area adjoining the Polyclinic to the University of Rome. A body of experts was appointed to make a survey of conditions and draw up an estimate of expenditure entailed by the construction on this site of as many university faculties as were scattered all over Rome. The figure was announced as 70,000,000 lire. A convention was signed by cultural institutions in April, 1932, to raise the funds required. The act also set the date of opening of the new premises on April 21, 1935.

Signor Marcello Piacentini, a member of the Royal Italian Academy, was appointed architect, and at the suggestion of Premier Mussolini he appointed a body of young collaborators, to each of whom he assigned a share of the work, reserving for himself the supervision of the whole and the planning of the central buildings to house the Rectorate.

The area allotted is square in shape, with sides about 550 yards long. It is flanked by another stretch of land to be eventually occupied by the students' hostel and the university playgrounds and gymnasium. The site is to be walled in to ensure seclusion and silence, and the actual buildings are to occupy only one sixth of the total area.

The ground-plan of the university city is linked up with Greco-Roman and Renaissance traditions. There will be 12 buildings in symmetrical formation along two main roads, which form a large open space where they cross. The fore part of the central building will be 15 stories high. The rear part, which is lower, will be chiefly taken up by a great lecture hall to accommodate 3,000 persons.

SUMMER SCHOOL ENROLMENT AND COST

AMERICA'S summer school population has increased nearly four times in less than 20 years, according to a statement made by Dr. Walter J. Greenleaf, of the Office of Education.

Nineteen years ago there were only 83,234 students enrolled to take some sort of college work in institutions of higher learning throughout the United States. Last summer's estimated enrolment in colleges and universities was 319,000.

The peak summer school enrolment in the United States was reached in the year 1932, when 414,390 persons took some sort of college work.

Summer school enrolments in colleges and universities from 1915 to 1932 are as follows:

[17] Smith, "History of Arithmetic," *op. cit.*, p. 133. Stevin's "La Disme" is translated in "A Source Book in Mathematics," by David Eugene Smith, pp. 20–34. New York, McGraw-Hill Book Company, 1929, "La Disme" is the antecedent of our "dime."

1915	83,234
1916	89,438
1918	78,059
1920	132,849
1922	220,311
1924	278,125
1926	340,461
1928	382,766
1930	388,006
1932	414,390
1933 (estimated)	319,000

Summer schools are for the most part self-sustaining, and the student pays full costs since no appropriations are provided for carrying on such work. Often persons are admitted as auditors to summer-school courses or to occasional lectures without credit upon payment of the regular tuition fee. They receive certain privileges of the campus, buildings and summer events. At small additional cost excursions are frequently arranged during the summer session to acquaint students with local points of interest and historical landmarks.

For the six weeks' summer session, tuition rates range from $17 to $100, with the most usual charge from $30 to $40. If laboratory courses are elected there will be an additional fee of a few dollars.

Board and room for six weeks will range this year for those studying during the summer from $30 to $100, according to the institution and its location. Charges are probably less in the Middle West than on the east or west coast.

THE HARVARD UNIVERSITY SUMMER SCHOOL

DR. KIRTLEY F. MATHER, director of the Harvard University Summer School, gives in the *Harvard Alumni Bulletin* details in regard to the coming session, which opens on July 2 and closes for the regular classes on August 11. With the cooperation of the Institute of Pacific Relations, there will be offered two intensive courses in the Russian language for a period of twelve weeks, from June 25 to September 15. These courses are primarily intended for advanced students with some experience in research, who desire to acquire a knowledge of Russian as a tool for investigation in their respective fields.

Professors George Z. Patrick, of the University of California, and Samuel H. Cross, of Harvard University, assisted by two Russian lectors, will be in charge.

Among the visiting instructors this year, three are coming to the Summer School for the first time. Dr. Charles A. Ellwood, professor of sociology at Duke University, will conduct two courses, "Introductory Sociology" and "Social Pathology and Social Programs," with field trips to social agencies in the vicinity of Cambridge. James Edward Peabody, recently head of the department of biology at the Morris High School, New York City, will give a new course in education, "The Teaching of Biology in Secondary Schools." Dr. Robert Ulich, visiting lecturer on comparative education, formerly counselor in the Ministry of Education, Saxony, and professor of philosophy in the Higher Technical School, Dresden, Germany, will lead the study of "Social Policy and Education."

Other members of the faculty include: Dr. Albert Schinz, professor of Romance languages at the University of Pennsylvania; Roy Dickinson Welch, professor of music at Smith College; and Dr. Kenneth J. Conant, associate professor of architecture; Dr. A. Hadley Cantril, Jr., instructor in psychology; Dr. Frederick W. C. Lieder, associate professor of German; Dr. Kirsopp Lake, professor of history; Dr. Marshall H. Stone, associate professor of mathematics; Dr. Paul J. Sachs, professor of fine arts, and Dr. Payson S. Wild, Jr., instructor in government—all of Harvard University.

Among the new courses of special social significance are, "Agricultural Policies and Problems" in the department of economics, and "Recent Trends in American Government" in the department of government. The department of physics is offering a course on "Light," and the department of psychology one on "Child Psychology."

Associate Professor Kirk Bryan is to direct field work in geology in the Jemez Mountains of central New Mexico. The party will gather in Albuquerque. The first camp will be in the pine forest near La Cueva for the study of the great crater and the volcanic rocks of the Valles Mountains. The second and some of the later camps will be on the west flank of the Nacimiento Mountains, where 10,000 feet of upturned sedimentary rocks afford opportunity for the study of structure and stratigraphy. The last

two weeks of the course will be devoted to an extended trip, 1,200 to 1,500 miles, to view and study the broader aspects of the geology and geomorphology of the region.

THE INSTITUTE OF PUBLIC AFFAIRS AT THE UNIVERSITY OF VIRGINIA

AN effort to evaluate the work of the NRA will be made during the eighth Institute of Public Affairs at the University of Virginia in a round table discussion group under the leadership of Spencer Miller, Jr., of the Workers' Education Bureau. This group will meet daily during the second week of the institute, from July 9 to 14.

Donald Richberg, general counsel for the NRA; David Cushman Coyle, member of the reviewing board of the Public Works Administration; William Green, president of the American Federation of Labor; Dr. Leo Wolman, chairman of the Labor Advisory Board, and Dexter Keezer, director of the Consumers' Advisory Board, are among those who have accepted invitations to take part in these discussions.

The NRA will be considered from the political and economic point of view at the opening meeting on July 9 when Mr. Richberg will be one of the speakers.

Gerard Swope, formerly a member of the NRA Industrial Board, and George Houston, president of the Baldwin Locomotive Works, have been invited to speak on July 10 when industry and the NRA will be discussed.

Labor and the NRA will be the subject on the program for the Wednesday meeting. Mr. Green and Dr. Wolman have agreed to speak on that day and Miss Mary van Kleeck, director of the department of industrial studies of the Russell Sage Foundation, has been invited.

The consumer under the NRA is to be discussed on Thursday. Mr. Keezer will be one of the speakers and F. J. Schlink, president of Consumers' Research, and Mrs. Herbert Lederer, of the Women's Division of the NRA in New York, may also be on this program.

Mr. Coyle and probably Dr. Leon Henderson, director of research of the NRA, will be the speakers on Friday, July 13, when trends in the recovery program are to be considered. There will be a general discussion of the entire program of the NRA at the closing session on Saturday morning.

Mr. Richberg on July 9 and Mr. Coyle on July 13 will be speakers before evening public meetings.

CONFERENCE OF EDUCATIONAL WORKERS IN CORRECTIONAL INSTITUTIONS

A CONFERENCE in which educators, penologists, psychologists, psychiatrists and others will participate will be held at Teachers College, Columbia University, on August 10. This conference has been called for the purpose of studying the educational problems of correctional institutions. Meetings will be held in the morning and a luncheon-meeting will gather later at the Men's Faculty Club of Columbia University, at which Warden Lawes, of Sing Sing Prison, will describe "How a Warden Looks at Education," and Mr. Sam A. Lewisohn will discuss "The New Deal in Prison Policies." For the afternoon round tables have been set up at which the following topics will be discussed:

"The Place of Mental Hygiene in the Prison and Reformatory School."
"Relationship of Classification of Prisoners to Educational Programs in Prisons and Reformatories."
"The Rôle of Health and Physical Education in Programs for Delinquents."
"The Administration of Education in Prisons."
"Relationships of Correctional Institutions to Community Social Agencies."

The evening meeting will consist of speeches by Mr. Calvin Derrick on "Ways and Means of Improving Educational Programs in Prisons and Reformatories," and by Dr. William E. Grady on "The Relationship of the Program of Public Education to the Problem of Delinquency."

The program for the conference has been prepared by Governor Lehman's Commission for the Study of the Educational Problems of Penal Institutions for Youth, which is composed of laymen, workers in penological institutions and educators.

HONORARY DEGREES CONFERRED BY NEW YORK UNIVERSITY

DURING the commencement exercises of New York University the honorary degree of doctor

of laws was conferred upon Dr. Elmer Ellsworth Brown, who is chancellor emeritus of the university; Harold Willis Dodds, president of Princeton University; James Bryant Conant, president of Harvard University; James Rowland Angell, president of Yale University, and Thomas William Lamont, banker and partner of J. P. Morgan and Company, and the degree of doctor of music was conferred upon Lawrence Tibbett, baritone of the Metropolitan Opera Company.

In conferring the doctorate of law on the four college presidents Chancellor Harry Woodburn Chase said:

JAMES ROWLAND ANGELL

James Rowland Angell: In recognition of the splendid service you have rendered to the cause of American education, for your friendly interest in this university, and in token of our admiration for you as a man, as an administrator, and as an educational statesman, we now confer upon you the degree of Doctor of Laws of New York University.

JAMES BRYANT CONANT

James Bryant Conant: You have already achieved international recognition in the world of scholarship. Called to the presidency of America's oldest university, you have already shown that sane, keen and penetrating originality of mind as an executive that has distinguished you as a scholar. With a hearty Godspeed to you in your new career, I confer upon you the degree of Doctor of Laws with all its rights and privileges.

HAROLD WILLIS DODDS

Harold Willis Dodds, the distinguished university which you serve has found in her own faculty a leader whose election has been hailed with unusual acclaim—an acclaim based on a recognition of that solid achievement which has distinguished your career. We greet you as neighbor and friend, and it is with genuine pleasure that I now, by virtue of the authority vested in me by the council of New York University, admit you to the degree of Doctor of Laws.

ELMER ELLSWORTH BROWN

Elmer Ellsworth Brown, my friend, New York University, that you have loved and served with all your heart for a quarter of a century, offers you to-day this tribute of her appreciation. You have wrought well through all these busy years. It is with the wish of every one of us for long and happy and useful years for you that, by virtue of the authority you have so graciously surrendered to me, I now pronounce you an honorary alumnus and a Doctor of Laws of New York University.

THE RETIREMENT OF PRESIDENT AMES OF THE JOHNS HOPKINS UNIVERSITY

PRESIDENT JOSEPH SWEETMAN AMES, of the Johns Hopkins University, announced at the commencement exercises of the university on June 12 his intention to retire at the end of the next academic year.

President Ames's retirement will terminate an official connection with the university that has lasted continuously for fifty-one years. He was enrolled as a student in 1883. His name appeared in the list of the graduating class of 1886; as a fellow in 1887–88, and as an assistant in physics in 1888–91; it appeared on the list of graduate students granted the degree of Ph.D. in 1890. Dr. Ames became associate in physics in 1891, associate professor in 1893, professor in 1899, provost in 1926–29 and president in 1929. When he assumed the presidency five years ago he announced privately his intention of retiring at the end of the academic year during which he reached the age of seventy years.

Dr. Ames is the fourth president of the Johns Hopkins University, the others being Daniel Coit Gilman, Ira Remsen and Frank J. Goodnow. He was a personal friend and colleague of each of them. His term of service with the university comes within seven years of covering its entire history. The recent commencement was the fifty-eighth for the university and the fifty-first for Dr. Ames.

Dr. Ames has guided the university through one of the most difficult periods in its history. His assumption of the office of president coincided almost exactly with the beginning of the depression; and the history of the Johns Hopkins, like that of every other endowed institution, has since been a story of shrinking income. Nevertheless, with the cooperation of the faculties, expenses have been reduced without sacrificing essential service.

THE EIGHTH PRESIDENT OF WESTERN RESERVE UNIVERSITY

THE eighth president of Western Reserve University is Dr. Winfred G. Leutner, who was elected by the board of trustees on June 12 and

who was inaugurated the following morning in the presence of the faculties and the graduating class of the university and of representatives of Ohio colleges and universities who had been invited to attend the installation of "a president." Since last December, when Dr. Robert E. Vinson resigned because of ill-health, Dr. Leutner has been acting president. He has served the university for twenty-nine years, as teacher, dean of Adelbert College from 1912 to 1925 and dean of administration since 1925.

When informed that he had been officially chosen, Dr. Leutner said:

> Election to the presidency of a great institution such as Western Reserve University would be, to any man, a challenge. I have been associated with the board of trustees, faculty, graduates and students for a good many years. Under these circumstances my election to the presidency has special, personal meaning, for my associates must often have seen my work when it was not at its best. They and the other old friends in Cleveland and elsewhere have been more than kind in their expression of confidence. My principal effort and my great hope will be that I may continue to deserve their friendship and support to the end that Western Reserve University and its affiliated colleges may go on to greater strength and greater achievement in the interest of the great community in which they are located.

Tribute to Dr. Leutner was paid by Mr. Newton D. Baker, chairman of the board of trustees, both in his announcement of the election and at the installation. He expressed "great satisfaction and confidence" in the new president and pointed out that Dr. Leutner's "lifelong connections with the university and his lifelong residence in Cleveland are great assets for a university which wants to serve a great city which needs to be served."

In his inaugural address, President Leutner referred to the serious financial difficulties which face Western Reserve as a result of the depression and acknowledged contributions of about $150,000 from alumni, faculty, students and friends toward meeting the current deficit.

EDUCATIONAL NOTES AND NEWS

DR. JOHN LLOYD NEWCOMB was installed as president of the University of Virginia on June 12. He succeeds the late Edwin Anderson Alderman, who was the first president of the university. Since the death of Dr. Alderman, Dr. Newcomb has served as acting president.

PROFESSOR J. NELSON NORWOOD has been named president of Alfred University. He had been acting president since the sudden death last autumn of Dr. Paul E. Titsworth, who had been president only for a short time.

DR. GORDON KEITH CHALMERS, professor of English at Mount Holyoke College, has been elected president of Rockford College, Illinois. He will succeed Dr. William Maddox, who died last August.

DR. DEXTER MERRIAM KEEZER has been appointed president of Reed College, Portland, Oregon, to succeed President Norman F. Coleman.

DR. SHELTON J. PHELPS has accepted the presidency of Winthrop College, the South Carolina State College for Women at Rock Hill. He will assume his new work at the end of July. Dr. Phelps has been professor of school administration at George Peabody College for Teachers since 1919; director of instruction, 1927–1931; dean of the graduate school, 1931–1934. The retiring president, Dr. James P. Kinard, has been given the title of president emeritus in recognition of more than forty years service to Winthrop College. He will continue as an active member of the faculty.

DR. ARTHUR A. HAUCK will take up his work as president of the University of Maine at the opening of the summer session on July 3.

RECIPIENTS of honorary degrees from Yale University conferred at its commencement on June 20 include the doctorate of laws on James Bryant Conant, president of Harvard University, and on William Lyon Phelps, Lampson professor of English literature, emeritus, Yale University; the doctorate of letters on Claude Moore Fuess, historian and author, principal of Phillips Academy, Andover, and on Charles Cutler Torrey, Sterling professor of Semitic

languages, emeritus, Yale University; the doctorate of humane letters on Robert Bartholow Harshe, director of the Chicago Art Institute; the doctorate of divinity on John Baillie, Roosevelt professor of systematic theology, Union Theological Seminary; the doctorate of science on Frederick George Keyes, professor of physical chemistry research, the Massachusetts Institute of Technology.

THE degree of doctor of letters was conferred by Temple University, Philadelphia, on June 14 on Dr. Robert C. Clothier, president of Rutgers University. Edward W. France, director of the Philadelphia Textile School, received the degree of doctor of humane letters.

PRESIDENT GILBERT W. MEAD, of Washington College, Chestertown, Maryland, was awarded the honorary degree of doctor of letters at the one hundred and nineteenth commencement of Allegheny College, Meadville, Pennsylvania. President Mead is a graduate of the college in the class of 1911.

PROFESSOR WILLIAM R. WESTHAFER, head of the department of physics and dean of the College of Wooster, received the honorary degree of doctor of laws from the Ohio Wesleyan University on June 4.

THE doctorate of laws was conferred by Niagara University on June 12 on Brother Adolphus Patrick, president of Manhattan College, New York.

DR. WILLIAM A. WIRT, superintendent of schools at Gary, Indiana, received on June 11 the degree of doctor of laws from DePauw University, of which he is an alumnus.

COLGATE UNIVERSITY, Hamilton, New York, conferred the degree of doctor of science on June 11 on Guido F. Verbeck, superintendent of Manlius School, and on William F. Langworthy, retiring professor of botany at the university.

THE fellowship honor award of the American Physical Education Association has been given to Dr. William G. Moorhead, of the Department of Public Instruction, Harrisburg. The award is made to members of the society for leadership in and contributions to the field of health and physical education.

DR. ROBERT J. BONNER, chairman of the department of Greek at the University of Chicago, has been elected an honorary member of Phi Beta Kappa by the Beta of Illinois chapter. Dr. Bonner was the speaker at the association's annual dinner, at which forty-nine students at the university became members in recognition of their scholastic achievements in the college.

DR. Q. A. W. ROHRBACH, professor of education at the University of Pittsburgh, was recently the guest of honor of the Phi Delta Kappa Chapter of the university. Dr. W. W. Patty, national vice-president and professor of education at Indiana University, was the principal speaker. Dr. Rohrbach leaves Pittsburgh this month to take up his work as president of the State Teachers College at Kutztown.

DR. JOHN DEWEY, professor emeritus of philosophy at Columbia University, has been appointed visiting professor in education at the Johns Hopkins University for the first term, and Dr. Thomas Woody, professor of the history of education at the University of Pennsylvania, has been appointed visiting professor for the second term.

PROFESSOR THOMAS NIXON CARVER, professor of political economy at Harvard University, will teach during the next academic year at the University of California at Los Angeles, as visiting professor of economics in the newly established Graduate School of Arts and Sciences. He will conduct two seminar courses, one on general economic theory and the other on monetary theory.

DR. LEOPOLD VON WIESE, professor of political economy and sociology at the University of Cologne, has been appointed Carl Schurz professor at the University of Wisconsin during the first semester of the next academic year. Professor von Wiese will be on temporary leave of absence from the University of Cologne, and will teach several courses in "Systematic Sociology" and "Recent Social Developments in Europe."

MISS GRACE ABBOTT, chief of the Children's Bureau of the Department of Labor since 1921, retires on July 1 to become professor of public welfare in the School of Social Service of the University of Chicago. She will also become editor of the *Social Service Review*. Miss Ab-

bott succeeded the late Julia Lathrop as head of the Children's Bureau in 1921.

DR. PAUL M. WHEELER, of the Johns Hopkins University, has been made head of the department of English at Winthrop College, South Carolina.

AT the Johns Hopkins University Dr. Allen W. Freeman has been appointed dean of the School of Hygiene and Public Health for three years from July 1. He succeeds Dr. Wade H. Frost, professor of epidemiology. Dr. Edward W. Berry, professor of paleontology, has been reappointed dean of the College of Arts and Sciences for a term of five years; Dr. Frederick S. Dunn has been appointed executive secretary of the Page School, in the absence of Mr. MacMurray. Other appointments include Dr. Edward H. Hume, Noguchi lecturer; Dr. Pasteur Valery-Radot, of Paris, Thayer lecturer in the School of Medicine, and Dr. Julius Lewy, formerly of the University of Giessen, visiting professor in the Oriental Seminary for the first term; Dr. Alan C. Woods, formerly associate professor of ophthalmology, has been appointed acting professor of ophthalomology, and Dr. Ludwig Edelstein, formerly of the University of Berlin, associate in the history of medicine.

DR. IVEY FOREMAN LEWIS, professor of biology at the University of Virginia, has been elected dean of the university, and Dr. George Oscar Ferguson, Jr., professor of psychology and education, assistant dean of the College of Arts and Sciences, has been made dean. Dr. Gordon Thomas Whyburn, associate professor of mathematics in Stanford University, has been elected professor of mathematics, and Dr. Albert Eugene Carey, since 1927 assistant in experimental pathology with the Rockefeller Institute for Medical Research, associate professor of pathology.

DR. JOHN S. BRUBACHER, associate professor of the history and philosophy of education at Yale University, has been promoted to a professorship.

DR. GEORGE J. RYAN, president of the Board of Education of New York, has accepted an invitation from the Italian government to visit educational institutions and universities in Italy. Dr. Ryan is a Papal Marquis, is an officer of the Crown of Italy and holds the Italian Gold Medal for his work in education.

DR. MORRIS B. LAMBIE, professor of political science at the University of Minnesota and relief coordinator for the state, has been invited by the American Municipal Association to spend a large part of the coming year attending economic conferences in various European capitals. For a number of years Professor Lambie has directed the program of the League of Minnesota Municipalities.

DR. GEORGE E. VINCENT, formerly president of the Rockefeller Foundation, was the commencement speaker at Connecticut College, New London.

DR. FRANK PIERREPONT GRAVES, president of the University of the State of New York and State Commissioner of Education, was the speaker on June 12 at the commencement exercises at Lehigh University.

PRESIDENT ROBERT M. HUTCHINS, of the University of Chicago, delivered the commencement address at the George Peabody College for Teachers, on June 8. His subject was "An Intelligible System of Education."

DR. ROBERT CLARKSON CLOTHIER, president of Rutgers University, gave the address at the commencement of the Junior College of Connecticut, Bridgeport, on June 13.

DEAN FREDERICK E. BOLTON, of the University of Washington, Seattle, was the chief speaker at the recent conference on elementary education arranged by the State Normal School at Monmouth for school executives and teachers of Oregon. About a thousand were in attendance. Dr. Bolton delivered two addresses at the general assemblies on "America's Biggest Big Business" and "Some Paramount Objectives under the New Deal." He also spoke at the Phi Delta Kappa-Pi Lambda Theta banquet on tendencies toward centralization in education.

As a memorial to Dr. John Grier Hibben, fourteenth president of Princeton University, the alumni will endeavor to raise funds to endow twenty memorial prize scholarships. An endowment of $25,000 will be required for each

scholarship. The annual stipend will be $1,000, more remunerative than any scholarship now in existence at Princeton.

ALUMNI of the College of William and Mary returned on June 9 to pay tribute to Dr. J. A. C. Chandler, president, who died on May 31. Dr. Chandler was to have celebrated his fifteenth anniversary as head of the college, and the alumni reunion had originally been planned as a celebration for that event. A bound book of 200 letters of appreciation and congratulations from prominent men and women alumni was to have been presented to him by his oldest son, Herbert G. Chandler.

DR. JAMES BRYANT CONANT, president of Harvard University, delivered the address to the senior class of Stevens Institute of Technology at the commencement exercises on June 9.

AN Economic Conference was held from June 18 to 22 at George Peabody College for Teachers, at which fundamental factors and principles essential to the understanding of the present economic, industrial and agricultural situation in America were presented through lectures and round table discussions. Speakers at the meeting included Dr. John T. Madden, dean of the School of Commerce and director of the Institute of International Finance, New York University; the Honorable Jesse Jones, chairman of the Reconstruction Finance Corporation, and General Hugh S. Johnson, National Recovery Administrator.

THE American Educational Research Association will meet this summer for the first time in conjunction with the National Education Association. The meeting will open in Washington, July 5, at 2 P. M., in the lecture room of the National Academy of Sciences. The program includes papers on "Motion Pictures," by W. W. Charters, director of the Bureau of Educational Research, Ohio State University; on "The Use of the Radio," by Tracy F. Tyler, secretary and research director of the National Committee on Education by Radio; on "Personality Records of Children," by Ben D. Wood, associate professor of collegiate research, Teachers College, Columbia University, and on "Standardized Tests," by J. Cayce Morrison, assistant commissioner for elementary education, New York State Department of Education.

THE American Council of Learned Societies offers in 1935 grants in aid of research and post-doctoral fellowships for training and research in the humanities for which application must be made by December 15. The grants are in two categories: small grants, not exceeding $300, and larger grants, not exceeding $1,000. Applicants for grants must possess the doctorate or its equivalent, and must be actually in need of the desired assistance and unable to secure it from other sources. The grants are made for specific purposes (other than living expenses or in lieu of salary), such as travel, photostats, secretarial assistance, etc., in connection with projects of research actually under way. The fellowships have a basic stipend of $1,800, to which allowances for travel, expenses of research and other purposes may be added. Applicants must have the doctorate, must not be more than thirty-five years of age, and must have demonstrated unmistakable aptitude for constructive research. Further information can be obtained from the American Council of Learned Societies, 907 Fifteenth Street, Washington, D. C.

ANNOUNCEMENT has been made by the University of Denver, through its Department of Speech and Dramatic Arts, of twenty scholarships in dramatics and twenty scholarships in debate to be given to outstanding high-school juniors. These awards are for a four-weeks period, from June 27 to July 25, 1934, at the university for the purpose of fostering speech work in the high schools and encouraging the development of worthy talent in dramatic arts among high-school students. Arrangements will be made for students to attend several dramatic performances produced at local theaters for both entertainment and practical instruction. Debate students will receive thorough instruction in the latest methods of debate and will work on the question, "Federal Aid to Education."

THE National University Extension Association announced at its meeting in Chicago on May 18 a number of correspondence courses designed to explain to the average citizen the meaning and implications of the New Deal. W. S. Bittner, secretary of the association, states

that university extension departments during the past year have made a special effort to develop courses intended "to adjust the thinking of adults to the changes going on in industrial and social life." Practically all university extension departments now offer courses on economics and political science with emphasis on international relations, the New Deal, the NRA, currency, taxation and problems related to unemployment. Likewise, courses on art, appreciation of music, contemporary literature and similar subjects are now available. Mr. A. M. Harding, president of the association, states that registration in courses coming under the latter group are increasing. New types of courses in vocational guidance are being developed by several extension departments.

ONE hundred presidents of American colleges recently signed a letter and sent it to President Roosevelt, protesting against war, and urging the immediate passage of drastic anti-war legislation. The following quotations from the letter are taken from the *Christian Science Monitor*, for May 18: "An act empowering and requiring the President of the United States to declare a complete embargo upon trade between this country and any belligerent nation in the event of hostilities in any part of the world." "An act prohibiting the use of the armed forces of the United States either for the collection of debts owed to Americans by foreign nationals or their governments, or for the protection of American property owned abroad." "An act prohibiting the manufacture, purchase or sale of firearms, and of ammunition of every description, within the United States, or in foreign trade between the United States and other countries, except by the Federal Government of the United States or under license and complete control by the Federal Government." Five other suggestions deal with the flotation of war bonds, removal of the possibility of great profits for munition makers in the event of war, adherence of the United States to the World Court, steps toward joining the League of Nations and the offer of cooperation with the League in the meantime.

THE Ironwood, Michigan, Board of Education has announced increased salaries for teachers of the grades, high school and junior college for the next school year. Arthur E. Erickson, superintendent of schools, is reported to have stated that the increases will be from 8 to 15 per cent., averaging about 10 per cent.

DISCUSSION

WHAT CORRELATION IS THERE BETWEEN EDUCATION AND VOCATION?

A YOUNG man came into my office recently and gave me the high sign of a Massachusetts Institute of Technology graduate. I recognized him as a graduate of five or six years' standing of the cooperative course in electrical engineering, who had taken his cooperative work with the Boston Elevated Railway. I returned his salute and asked him what he was doing and how he was getting along.

He was in the life-insurance business, vice president in charge of agency organization and sales promotion, a director and a member of the finance committee. I laughed and said jokingly: "Well, you are exhibit A of a wasted engineering education. You take a five-year course full of higher mathematics, advanced scientific theory and laboratory technique. You spend sixteen months qualifying as motorman, conductor and inspector, grub away in the car shops, work over traffic studies and timetables, experiment on the acceleration and control of trolley cars and trains; then you become a life-insurance agent. That's my idea of a wasted education."

"You're dead wrong, professor," he came back. "It's just the right education for the job. I needed a stiff course in mental training. I had to learn to think hard and long and straight. That's just how an engineer has to think, and I got the knack and habit of thinking this way by studying electrical engineering for five years. I learned to get the facts and to distrust opinions. Man! I'll never forget the call-down one of the fellows got when he used a statement in a popular magazine as an authority to back up an argument. I learned from the Lab. that there are ways of getting facts if you really go after them. As for the time I spent on the Boston Elevated, man, that was one of the most valuable parts of my education. I mixed

with all kinds of men—lumpers, craftsmen, engineers and superintendents. I learned the way the other fellow thinks and what his viewpoint is likely to be on all sorts of subjects. I learned a lot from every one of those Boston Elevated men. Yes, sir, the whole course is an ideal training for my insurance work. Why do you suppose they made me vice president instead of keeping me working as one of their agents? It was just because I had the advantage of a kind of education that the other fellow had missed, which made me able to do things he couldn't do."

This young man's story is a rather striking one, but it isn't by any means unique. In fact, it more or less typifies the attitude held by scores of other engineering graduates who have found their life work outside of the vocational compartment statistically labelled "Engineering."

The usual method of arriving at a figure to designate the extent of correlation between engineering education is to make a survey of engineering graduates and classify them according to whether or not they are in engineering work. In 1923 such a survey was made by Eta Kappa Nu, which is an honorary fraternity of electrical-engineering students and graduates. The distribution of its alumni among the various occupations ought to be fairly typical of the general distribution of electrical-engineering graduates. A questionnaire was circulated to 1,714 electrical-engineering graduates, of whom 844 replied. These were listed as to whether they were in electrical engineering, other engineering or non-engineering. The results of this kind of tabulation were published by the Society for the Promotion of Engineering Education in 1929, and showed that 61.4 per cent. of the graduates remained in electrical engineering, and that 83.5 per cent. were in some kind of engineering. This leaves only 16.5 per cent who were in occupations outside the engineering classification. It is interesting to note that the graduates of later classes tend to stick closer to electrical engineering than the graduates of the earlier classes and that a smaller percentage of them are in the non-engineering field. Based on these statistics alone, we might be tempted to draw the conclusion that in the electrical-engineering courses as a whole there is about a 60 per cent. correlation between electrical-engineering education and the vocations which the graduates enter.

An interesting study was made of what the 61.4 per cent. were doing who remained in electrical engineering. Nearly half (42.9 per cent.) went into the technical group, and 17.8 per cent. were in operation and maintenance. There was also a decided shift among the older graduates from these two groups into the administrative group. This is to be expected. Administrators are ordinarily drawn from the older graduates. There is also a similar shift among the older classes to the commercial group.

Of the 16.5 per cent. who went into non-engineering work, over half are in administrative work, while among the older graduates this ratio is a little more than two thirds. A logical conclusion from this study would be that an electrical-engineering education is effective in giving a young man the broad fundamental training in habits of thought which fits him for administrative responsibilites, even though his duties are not connected with engineering details.

Later, in June, 1932, the *Journal of Engineering Education* published the results of another study. This included graduates of civil, electrical, mechanical and other engineering courses in land-grant colleges, and covered the records of 9,334 graduates. In this study graduates classified as being in engineering work included the professional engineers and all others in occupations closely allied with engineering, such as teaching in the engineering field. According to this classification, it was found that 62.3 per cent. of all the graduates remain in engineering work. There was the same drift among the older graduates away from the engineering field into other responsibilities. These figures corroborate the figures concerning electrical engineers.

The apparent conclusion from such statistics is that the correlation between the education and vocation of a graduate in engineering is only about 60 per cent. But this kind of statistical study is an exceedingly artificial way of testing the correlation between education and vocation. The assumption is made that correlation exists only when a graduate in engineering goes into a vocation that has the tag

"Engineering" tacked on to it. This is making the limits of the correlation altogether too narrow. A much fairer criterion of correlation would be to try to answer the question, "To what extent does a given college course fit a man for the job; first, as to habits of thought and action, second, as to the factual knowledge needed for the job?" The college course that does this best has the closest correlation.

Now concerning an engineering education, it has sometimes been said that the engineer gets his mental training and scientific methods of attack almost entirely from scientific material, that is, the facts and theories of mathematics, chemistry and physics, and therefore he enters his vocation ignorant of the great mass of knowledge and philosophy which constitutes the study material of courses in law, literature, economics and political and industrial history. But let us investigate the facts. Consider, for instance, the course in electrical engineering at M. I. T., the curriculum with which I am most familiar. To be sure, the great backbone of the curriculum is a series of subjects dealing with theoretical mathematical physics, but this backbone is augmented and buttressed all through the first two years by courses in English and in political and industrial history and in the senior year by the seminar course in biographies of the scientists. There are two courses in political economy, and at least two general studies from a long list, including psychology, humanics, international law and American foreign policy, as well as numerous courses in literature and history. In the cooperative course, two of the required subjects are business law and business organization.

Just considering subject-matter alone, what better array of facts and knowledge could a man bring to his vocation than that represented by a study of such a curriculum? Imagine a conference among four leaders from four outstanding professions, say a lawyer, an economist, a financier and an engineer. Each must be a specialist in his own particular field, but each should have a broad knowledge of the fields of the others in order to effectively work with them. I am willing to wager that the engineer would know more about the fields of the other three professionals than all the three others would know about his. I believe I can confidently state that the graduate of an engineering school is more likely than a graduate of any other professional school to have the advantage, not only of having had a superior mental training in the analysis of facts, the drawing of concrete conclusions and in the actual doing of the job, but also of bringing to his task a larger mass of facts and information pertaining to the problem than the graduates of any other professional school. We read, and hear it said over and over again, that we live in an engineering world. Modern civilization is built upon the discovery and application of scientific facts and scientific methods. If this is so, then the factual side of one's education should consist of the knowledge of scientific and engineering facts, theories and methods. It is this kind of material that makes up by far the greater part of the material contained in a modern engineering course, and while we recognize that the prime purpose of an engineering education is not the acquisition of knowledge and facts, but rather the training of a man to think straight, nevertheless it is true that the very information which he acquires in the process of receiving his training is of such a nature as to be of the very greatest possible use to him. In other words, the engineering course, as now developed, gives the graduate habits of thought by which he is enabled effectively to tackle modern problems, and at the same time gives him a mass of information of such nature that it is bound to be of maximum use in his chosen vocation, almost regardless of what that vocation may be.

But there is another correlation, the nature of which is rather hard to put into words. It is the correlation between the spirit of a man's education and the motives which later should govern not only his vocation but his whole life. If it is important that the factual material and the thought processes acquired at school should be directly applicable to a man's vocation, it is far more important that those mental attitudes and ideals be instilled in the student, the application of which in the practice of his vocation will have a beneficent effect upon society. More tritely, when a man's whole life work has been summed up, the world should be a better place to live in as a result of his having lived in it and worked in it.

The unselfish devotion of science and engineering to the constant bettering of mankind's condition is too well recognized to need elaboration. Young men who receive their education in this atmosphere bring to their vocations, however diverse they may be, this traditional spirit of service. Of course, some graduates have caught more of it than others, but few take four years of engineering training without acquiring some of it. What the world needs at present is more men with these ideals of science and engineering, and it needs them in every vocation. So, whatever vocation he may enter, if the engineer is true to his educational ideals, he brings to it the very element most urgently needed by that particular vocation.

Thus, when we take as our criteria the power and habit of straight thinking, the acquisition of the most useful body of knowledge, the inculcation of high ideals, we are compelled to arrive at the conclusion that there is a most gratifying correlation between the education of the modern engineer and almost any vocation that he may choose as his life work.

W. H. TIMBIE

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

PRESIDENT ROOSEVELT'S VOCABULARY

AT the present time molding public opinion looms important. Millions of people in a few minutes and at one time over a nation-wide radio network listen to the same message. Social and political leaders are readily taking advantage of this vehicle of communication. The general population has become accustomed to hearing these leaders. President Roosevelt's voice is familiar to millions. He has been called the "Radio President."

For the educator it becomes a significant problem to isolate some of the specific characteristics of those who have been so influential in directing public opinion. What are these attributes that may be more or less significant to those who must formulate educational programs? Obviously language is a basic attribute.

The many investigations which psychologists and educators have conducted on vocabularies make it possible to approach the study of this phase of Mr. Roosevelt's language. Results of this study are briefly summarized in the table to aid the reader in following the analysis.

Occurrence of words[1] in general reading	Franklin D. Roosevelt: Inaugural address	Franklin D. Roosevelt: Radio address Oct. 22, 1933	Lincoln's Gettysburg address
	Per cent.	Per cent.	Per cent.
500 most common words	67.8	72.9	77.7
1,000 " " "	74.2	80.6	85.5
2,000 " " "	82.9	87.9	90.7
3,000 " " "	86.8	91.1	94.0
4,000 " " "	89.5	93.0	94.0
5,000 " " "	92.0	94.3	98.5
10,000 " " "	97.0	97.2	99.3
15,000 " " "	98.0	97.8	99.6
20,000 " " "	99.5	98.0	100.0

An examination of the figures in this table shows that about 70 per cent. of the words in the inaugural address and in the radio address (portraying national conditions) occur among the first 500 most common words found in general reading material. In each of these addresses 74.2 per cent. and 80.6 per cent. of the vocabulary, respectively, fall in the first 1,000 most common words. These thousand most common words cover 85 per cent. of the vocabulary in the written material of college students[2] and 85.5 per cent. of the vocabulary in Lincoln's Gettysburg address.

In the first 5,000 most common words are included 92.0 per cent. and 94.3 per cent. of the vocabulary in Roosevelt's two addresses and 98.5 per cent. of the vocabulary in Lincoln's Gettysburg address. This number is nearly the maximum writing vocabulary of college students and provides 90 per cent. of the vocabulary in books of fiction.[3]

The October radio talk by President Roosevelt shows his successful attempt to confine himself to more commonly understood words. The

[1] E. L. Thorndike, "Teacher's Word Book," 1932.

[2] P. A. Witty and M. Fry, "The Vocabulary Content of Composition Written by College Students," *Jour. Educ. Res.*, 19: 135–138, 1929.

[3] P. A. Witty and L. L. LaBrant, "Vocabulary and Reading," SCHOOL AND SOCIETY, 31: 268–272, 1930.

vocabulary in this talk is more simply couched than his inaugural address. The Gettysburg address is a picture of even greater simplicity of vocabulary. It is interesting to note that during student days at Harvard Mr. Roosevelt participated quite actively in the college paper and served as editor.

The results of this experiment leave open the question as to whether simplicity of vocabulary is the principal factor determining the effectiveness of President Roosevelt's messages in reaching the average man. Supplementary consideration should be given to the style and diction, to the personality of Mr. Roosevelt's voice and to his rôle as a public personage.

RICHARD S. SCHULTZ
THE PSYCHOLOGICAL CORPORATION
NEW YORK, N. Y.

SPECIAL CORRESPONDENCE

EDUCATION AND CULTURE CONTACTS

YALE UNIVERSITY offers from July 30 to September 8 as its fourth summer seminar in education a study of the general topic, "Education and Culture Contacts." A cosmopolitan faculty of internationally recognized distinction will come together under the direction of the department of education of the Graduate School to present to a carefully selected group of students the opportunity to study and discuss the social, religious and educational problems which arise in areas where different races and cultures come into contact with one another.

From the time that civilizations began to fringe one another, the problems resulting from the overlaying of cultures have been apparent. The establishment of the first trade routes, bringing together peoples of greater cultural differences, complicated the situation. To-day, in a world knit closely together by the devices of modern science and invention, the problems have become extraordinarily complex and difficult. The ultimate analysis and solution of these problems would prove an effective approach to the realization of world peace and concord. For this reason the seminar should be timely and of general interest.

Although credit is not a controlling factor of the seminar, arrangements can be made for the taking of examinations and securing of credit if the student so desires.

The members of the seminar will consist of directors of education, superintendents, supervisors, inspectors of schools, principals and teachers at training colleges and secondary and elementary schools, government officials, missionaries, social workers and others interested. Among the number will be twenty officials and representatives from the West Indies, twenty-five officials of the General Education Board and a number of men and women actively engaged in the field of culture contacts in both this and other countries.

The cooperation of the Carnegie Corporation of New York and the General Education Board has made it possible to offer to men and women of distinction in the various fields covered a limited number of fellowships covering the cost of membership in the seminar and board and lodging in the Hall of Graduate Studies. A limited number of tuition scholarships are also available to missionaries on furlough and others not in permanent employment. The members of the seminar are fortunate in having at their disposal the beautiful Hall of Graduate Studies at Yale where the meetings of the seminar will be held. They will also have recourse to the Sterling Memorial Library, the Penniman Memorial Library of Education, the Penniman Reading Room and new and important books and magazines, not only in education, but in related subjects. The resources of the Peabody Museum and of the special anthropological library will also be available.

The general topic, "Education and Culture Contacts," is subdivided into eight series of lectures and discussions. The method to be followed is the "lecture-discussion" type, which is used extensively at Yale and has proven very successful. The period of discussion following the lecture proper will give to the members of the seminar an opportunity to raise questions and advance contributions and opinions. In addition there will be special discussion groups and formal and informal evening lectures.

A brief résumé of the lectures to be given and their content is as follows: Professor Al-

fred R. Radcliffe-Brown, professor of anthropology at the University of Chicago and formerly professor of social anthropology at Capetown and Sydney, will give a series of lectures on "Comparative Sociology," including an analysis of the cultures of different peoples into such elements as health, family life, government, law, agriculture, industry, religion and recreation, with emphasis on those elements which chiefly concern the educator.

Mr. Arthur I. Mayhew, secretary of the British Government's Colonial Education Committee, London, will lecture on "Education in the British Colonies." Mr. Mayhew's lectures will include a summary of English influence on the education of India from 1800 to 1920; a discussion of education and culture contacts in Ceylon, Malaya, Hong Kong and Palestine; English educational aims, methods and results in the British dependencies, in tropical Africa and in the western Pacific; a comparison of the educational processes of assimilation and adaptation as carried out in India, the Far East, the West Indies, Africa, and elsewhere; and an analysis of the desirability and possibility of cultural unity in education and methods of preserving distinctive characteristics of widely varying civilizations and cultures.

Dr. Thomas Jesse Jones, educational director of the Phelps-Stokes Fund, New York, and well known for his surveys of education in Africa and the Near East, will present "The Essentials of Education"—an outline analysis of civilization and its educational implications.

Dr. Charles T. Loram, Sterling professor of education at Yale and chairman of a newly organized subdepartment of race relations, will lecture on "Education and Cultural Contacts in South Africa." Dr. Loram will deal with the cultural changes which are taking place among the South African natives as a result of contact with western civilization, and their implications for education.

Dr. W. Carson Ryan, director of education, U. S. Indian Service, Washington, has as his topic "The Education of the American Indian." These lectures will deal with the social and economic status of the American Indian, the present situation in Indian education and the reforms begun and contemplated.

President Francis Cho-Min Wei, Central China College, Wuchang, China, will discuss "Education and Culture Contacts in China." Mr. Wei's lectures will include a consideration of the conflict of cultures in China and an outline of the ancient and modern educational systems, with suggestions for the development of a system in keeping with China's needs to-day.

Dr. Frank Tannenbaum, who is at present undertaking a study of social, economic and educational conditions in South America and Cuba, will present "Education and Culture Contacts in Mexico and Latin America." He will give a survey of the present situation, together with an outline of the educational system in Mexico, with special reference to rural education in which Mexico has made significant progress.

Dr. Thomas J. Woofter, Jr., of the department of sociology at the University of North Carolina, will deal with the "Education of the American Negro." These lectures will consist of an analysis of the social and economic position of the Negro and the ways in which education is attempting to meet those needs.

Among those who have been invited to give lectures and take part in the conferences are: Dr. W. W. Alexander, director, Interracial Commission, Atlanta, Georgia; Professor Charles Johnson, Fisk University, Nashville, Tennessee; Professor U. W. Leavall, George Peabody College for Teachers, Nashville, Tennessee; President Frank E. Midkiff, Kamehameha Schools, Honolulu, Hawaii; Dr. Anson Phelps Stokes, chairman of the Phelps-Stokes Fund.

It is to be noted that each lecturer, due to his close contact with the field with which he is dealing, will be able to present to members of the seminar his own first-hand knowledge and experiences of the problem.

Professor Charles T. Loram, who is the director of the 1934 summer seminar, will be glad to answer all inquiries and send a prospectus of the seminar to all those who are interested.

CHARLES T. LORAM,
Director of the Summer Session

COLORADO HIGH-SCHOOL STUDENTS AS A MODEL HOUSE OF REPRESENTATIVES

TWO years ago the Ecclesia Club, a social science discussion group at the Adams State

Teachers College, sponsored a model Colorado constitutional convention for high-school students of the San Luis Valley in southern Colorado. This project proved so successful that the club decided this year to conduct a project along similar lines. Instead of a constitutional convention it was decided to have a model Colorado House of Representatives. The participants were to be as before high-school students with the guidance of the club members.

The model House of Representatives convened on April 16. An attempt was made to give all the atmosphere of a regular legislative chamber. Desks were arranged in semi-circles about the platform of the speaker and the press table. At the rear and along the sides sat spectators, consisting of non-participating students, collegians and faculty members and a number of townspeople. Behind the speaker was draped a large United States flag and the flag of Colorado. Adjoining rooms to the legislative chamber were arranged for committee meetings.

The Ecclesia Club sent out instructions and bibliographies weeks before the assembly, and the high schools were asked to conduct elections for their representatives. However, many found this impractical, although it would have lent a realistic touch. There was a fear among many that the best qualified would not be chosen.

The students came to the model House of Representatives knowing what districts they were to represent, the committees on which they were to serve and some of the principles which would be discussed. They registered on arrival, and all those not acting as Representatives were seated on the sides of the legislative chamber.

At ten o'clock the session was opened with the invocation by the assembly chaplain. After brief remarks of welcome the clerk read the official announcements and the assembly got under way. A temporary speaker was chosen and a permanent clerk designated. A committee on credentials was selected, who made its report, and a college student representing a judge of the supreme court administered the oath to the members. This was followed by the election of a permanent speaker, who had the clerk read the message of Governor Johnson. The governor went to no little effort in preparing a message for this model House of Representatives and laid down a constructive program of work that was adhered to quite closely by the youthful legislators.

At eleven o'clock the assembly adjourned to committee sessions to discuss proposed measures which were dropped in the basket at the speaker's desk at the beginning of the session. The committee meetings proved to be full of excitement. The number of committees was reduced to five in order to get a large enough group for discussion in each committee, they were: (1) Education, (2) Counties and County Lines, (3) Finance, (4) Appropriations, (5) Amendments. It was later found that other committees had to be appointed in order to discuss all the proposed measures, but these five remained the major ones throughout the session. Full discussion was permitted on all measures before the committees, and most of them held hearings to permit different interests to present arguments for and against the measures.

Lobbyists and pressure groups of all kinds attempted to influence legislation in the committee sessions and any other time they could get the ear of the members. Blank telegrams were filled out and carried in to the different legislator as well as piles of petitions on many of the subjects under discussion. Pages were scurrying to and fro, and the whole atmosphere was that of a legislative body working at top speed in order to draft solutions to some of the problems of the state.

Like most legislative bodies there were many more bills introduced than could be handled in the session, so most of them died in the committee rooms. However, when the voted hour of adjournment rolled around in the evening, the assembly found itself unable to pass many of the important measures up for the third reading, and they ordered the clocks to be stopped until they could partially complete their task.

There was no lack of realism in the assembly, down to the removal of a radical from the floor by the sergeant-at-arms. The students were given as much of the local color as possible without destroying the seriousness of the work by the Representatives. A mimeographed sheet was run off several times during the day which kept all the members familiar with what was

going on in all the committees. The legislators were in the constant atmosphere of the urgent problems of the state. Arrangements were made for groups who were working on the same committee to eat together.

Needless to say, these students learned much in the way of parliamentary procedure in the one day, but procedure was sacrificed many times in order to have full discussion of the problems under consideration.

The students and faculty advisers were so pleased with the experiment that they have requested the Ecclesia Club to again have a conference of high-school students. The apparent success of this project and the one tried several years ago, a model Colorado constitutional convention, has prompted the club to lay plans for similar conferences in the future to be held annually. It will be the policy to try a number of different projects, of local, national and international interest.

LASHLEY GREY HARVEY
ADAMS STATE TEACHERS COLLEGE
COLORADO

QUOTATIONS

ENGINEERING AS A FINE ART

DR. JAMES BRYANT CONANT, president of Harvard University, speaking on June 9 at the sixty-second annual commencement of Stevens Institute of Technology said that "members of two professions are certain to survive the worst of political and economic storms—the engineer and the doctor." President Conant said in part:

It has been well said that a man who knows exactly where he is going never gets there. This is particularly true of one's education. I take it that it is because of this impossibility of seeing the ultimate goal that we rejoice in an opportunity to applaud when each runner passes a certain post.

Many of you will probably find your permanent life work in applied science. You will practise some form of engineering or become connected with some business venture through your scientific training. I can not claim to speak to you to-day as a full-fledged engineer or an applied scientist but I have now and then spent some time on the technical problems which arise when science and industry meet. I may perhaps qualify as an ex-amateur, and as such rather than as a college president you will permit me to say something about the responsibilities which lie on the shoulders of the engineering profession.

In the first place, it seems quite clear that whatever sort of a social and economic order lies ahead of us, society will demand the luxuries and conveniences afforded by modern technology. Taking a long range view, and for the moment the most pessimistic one possible, it would seem to me that members of two professions were certain of surviving the worst of political and economic storms—the engineers and the doctors. . . . The engineers will be in a peculiarly important position of influence. Much may depend on the way they look at life, and their ideals and standards may have a determining effect on society at some not very distant date. If we want certain things preserved in this world it is to you gentlemen and your successors that we may have to look for their preservation.

The monks in the dark ages preserved the remnants of one civilization to enable another to come to life. Perhaps, in some measure at some time, the scientist and engineer may have a similar opportunity to transmit to posterity the studies we now call the humanities. This is the responsibility that lies heavily on the shoulders of engineers and scientists and those who educate them. I believe the men of applied science will prove themselves worthy of the challenge to whatever extent it is presented. I believe to-day in many institutions we are educating men who understand not only their technical professions but also the needs and aspirations of the human spirit. . . .

The significance of science, so it seems to me, is not to be found in an evaluation of its practical results or an enumeration of the shortcomings of the present industrial age. The significance of science to civilization is exactly like the significance of a Greek temple or a Greek drama. It must be regarded as one of the marvelous products of the human spirit which will have a meaning for man as long as he continues

on this planet. Perhaps we might liken the growth of modern science to the building of a medieval cathedral. It is the work of many hands and has arisen slowly and to some extent irregularly. . . .

May I illustrate the way in which science represents a collective enterprise running over many years by an example drawn from my own particular branch of the subject? A few years ago a German chemist, Hans Fischer, succeeded in synthesizing the red coloring matter of the blood, known as hemin. . . .

Now, it seems to me that the appreciation of scientific achievement has a cultural value comparable to that which comes from an understanding of poetry or art. The educational problem, however, of inculcating the basis for this appreciation is very difficult. I believe that the hidden springs of action of the artist and the scientist are essentially the same. The material success which has followed the application of science to industry has partially hidden the true nature of scientific endeavor from the lay public and perhaps even from the scientist himself. This is particularly true of applied science. I imagine that in some subsequent age when our technological marvels have lost their novelty the great scientists and engineers of our day will be thought of not so much as distributors of material benefits but rather as inspiring examples of the creative intelligence of the human race. They will be classed with the philosophers, the writers and the artists, and their work will be judged by similar standards.

From my experience with a great variety of technical men in universities and in industry, I feel sure that the zest of their work lies in the pure joy of its creativeness—in the thrill of overcoming the perpetual challenge which inanimate nature seems to present to the human brain. In this spirit, gentlemen, you will approach your own work. This is the spirit which has made possible all advances in knowledge. It is but another aspect of the imaginative vision which has inspired poets, painters and composers. The scientist is the most recent recruit to the ranks of creative workers. He must realize his kinship. He must be catholic in his appreciation of the present and humble in his judgment of the past. We may hope that art, literature and philosophy, if necessary, can be carried through a period of turmoil by the technical man who has had a liberal education and realizes to the full its implications.

REPORTS

A NEW CONCEPTION OF ACCREDITING STANDARDS

THE new program for the accrediting of higher institutions adopted by the North Central Association of Colleges and Secondary Schools at its annual meeting in April comes after three years of diligent search for an answer to the question, "What comprises a good institution of higher education?"

In common with other accrediting agencies, the North Central Association has been for several years the object of criticism both within and without the educational profession. The standards have been assailed as rigid, mechanical and minimal; the agencies as repressive and discriminatory.

That the old standards grew from a definite need for protection from "diploma mills" and various unethical practices, few of their critics have denied; that in their growth they had become inelastic and to some extent mechanical, few of their staunchest supporters failed to admit.

Out of the need for a more pliable method of evaluating an institution's excellence came the appointment of a Committee on Revision of Standards by the North Central Association. Within this committee a smaller group in charge of the study have sought by surveys of 57 cooperating institutions of various types to evolve criteria which would more truly indicate the value of an institution. Aided by financial support from the General Education Board, the association was able to undertake a study of sufficient scope as to furnish a basis for an entirely new accrediting program.

One of the most striking features of the new plan is the complete elimination of "standards" in the old sense. Instead of standards, a statement of policy has been adopted embracing 19 provisions, but without the word "standard"

occurring once. However, it is not the mere elimination of the word which is important; it is the elimination of the idea. There is to be no more "standardization" in the North Central Association.

Another basic change, closely related to the foregoing, is a new recognition of the necessity for individuality in institutions. Instead of attempting to force all into a common mold, the new plan allows each institution to develop its program in terms of its own objectives. Accrediting in the future is to be based, not on the degree of conformity to definite requirements, but on the degree to which the announced objectives are successfully achieved. The entire "pattern" which the institution presents as an institution of higher education will be considered.

In order to objectify the institutional pattern, a so-called pattern map has been devised which will show at a glance the percentile position of a particular institution, as compared with all other institutions, with respect to eighty-one characteristics. These characteristics are grouped under eleven major headings, such as faculty, library, student personnel service, and administration; and represent those characteristics which have been shown by research to be indices of excellence.

The percentile ratings will be based on criteria contained in the new statement of policy. In formulating these criteria, most of the criticisms which have been made of the old standards have been avoided; the new are general rather than specific, flexible rather than rigid, human rather than mechanical, maximal rather than minimal.

As an example of the type of criteria to be used, that on the subject of finance is here quoted because of the fact that the old endowment standards have been especial sources of irritation in the past. The new policy of the North Central Association on finance is as follows:

> The institution should provide evidence of financial resources adequate for and effectively applied to the support of its educational program.
>
> The items of information to be considered in determining the adequacy of the financial support are the expenditure per student for educational purposes; the extent to which the institution is dependent on student fees; the stability of the financing, as indicated by the amount of income per student from stable sources, and the avoidance of burdensome indebtedness; and the procedures in financial accounting and reporting. Necessary adjustments will be allowed for contributed services of instructors and administrative officers in Catholic institutions.

Due to the necessity of obtaining an increased amount of information concerning institutions being considered for accreditment, the new plan provides for a more detailed and extensive inspection than has been true in the past, except in case of surveys. The old one-man, one-day inspection is being abandoned in favor of an inspection by at least two persons who will spend at least two days at each institution. The inspectors will be provided with detailed schedules, so that data secured at all institutions will be comparable. While it is realized that it will be advantageous to have the same inspectors visit as many institutions as possible, there is no intention of creating a permanent inspectorial staff.

No change has been made in the actual organization of the association for accrediting. The reports of the inspectors, together with the pattern maps and any other information available will be presented to a committee of seven, called the Board of Review, which since 1927 has had delegated to it the preparation of the accredited lists of higher institutions. The recommendations of this board are presented in turn to the Commission on Institutions of Higher Education and the Executive Committee.

However, this new concept of accreditment, which discards all minimal standards and judges institutions in the light of their own objectives and in terms of those characteristics which this study has shown to be indices of excellence, is such a radical departure from prevailing methods that the results will be of interest to all who are concerned with problems of accrediting.

President L. D. Coffman, of the University of Minnesota, was chairman of the general committee. The following persons were in charge of the study: Dean M. E. Haggerty, University of Minnesota; Floyd W. Reeves, Tennessee Valley Authority; John Dale Russell, University of Chicago; D. H. Gardner, University of Akron; Douglas Waples, University of Chi-

cago, and George F. Zook, U. S. Commissioner of Education.

H. M. DOUTT

UNIVERSITY OF AKRON

TESTIMONY BEFORE THE SENATE COMMITTEE INVESTIGATING CRIME

FOR some months the Subcommittee of the Committee on Commerce of the United States Senate has been investigating crime and so-called "rackets" with a view to their suppression. The subcommittee, under the chairmanship of Senator Royal S. Copeland, has been taking testimony from a large number of individuals, representing the legal profession, law enforcement officers and educators. A digest of the hearings has recently been published by the United States Government Printing Office and is available for the use of citizens.

The following excerpts from the report are of special interest to educators:

THE STATUS OF CRIMINALS

Charles L. Chute: The great bulk of crime in this country is a youth problem, and its beginnings are nearly always found in misdirected childhood.

Irving W. Halpern: Crime to-day is the chosen field of youth, and the predominance of youthful offenders among those charged with crime has long been a subject for concern. . . . Young men, desirous of obtaining . . . those luxuries and amusements which their limited earning power in legitimate enterprise can not supply, have steadily drifted into the criminal ranks. The lure of easy money is constantly dangled before them by criminal associates and others with whom they come in contact. . . .

Howard W. Ameli: The real menace in our country to-day is the alarming increase in the number of our youthful criminals, who have not had or who have disregarded the opportunities for education in the trades, professions and business. Statements have been made to the effect that a large percentage of our criminals who have been imprisoned are under the age of 25 years. Youths of the age of 20 furnish the highest ratio; the next are boys of ages ranging between 18 and 19.

Dr. George Kirchwey: A few years ago we made a study of the total intake of our court of general sessions for a year, investigating particularly the 3,000 men who were arranged for the first time for a felony in that court . . . how many of them do you suppose had in childhood been in the Children's Court? Ninety-two per cent. of them had been. . . . What we are destroying in our present system is not only childhood but perhaps the most precious elements in our childhood, the courage, the daring, the capacity to do great things.

Henrietta Additon: As I was leaving the office this morning I received this report of a case, referred by a school: a boy, twelve years old, with the Irish name of Jerry, and a boy with a nice Italian name are accused of extorting two cents a week for protection from the younger children of the schoolyard. . . . We had a group of boys over in Brooklyn. We found that they were going into the small groceries and saying to the owners, "You give us so many sandwiches." They would make up the sandwiches and the boys would take them and say, "All right, thank you." The owners would say, "Where is the money?" The boys would say, "Well, we will come back and break up your windows, but if you give us the sandwiches and apples we will see that no other boys come in and bother you."

Senator Royal S. Copeland: Let me give you, in a word, what the division of investigation of the United States has discovered in this year of grace, 1933: During the first nine months of this year the arrest records, the fingerprint records of 241,000 persons were studied. Those arrested at nineteen years of age made up the largest of all the age groups. It numbered 12,418 individuals, charged with larceny, burglary, robbery, assault, rape and criminal homicide. Seventeen hundred were 15 years of age or younger; 20 per cent. were under 21, and three out of five were under 30. These figures cover the entire nation. In New York the percentage of youthful criminals was even greater. At Sing Sing, 50 per cent. were under 25 years, and 80 per cent. are under 30 years.

Irving W. Halpern: A recent survey completed by the Probation Department of the Court of General Sessions of the county of New York . . . reveals strikingly that the offenders twenty-five years of age and under represented 53.71 per cent. of the 12,744 criminal offenders whose histories were investigated . . . over a five-year period, . . . that those who were twenty-one years of age and under . . . numbered 33.87 per cent.

CHILDREN'S COURTS

Charles L. Chute: Hardly any well-informed person to-day will deny the importance of juvenile courts. They are the first line of defense set by society to deal with delinquency . . . when the home, the school, the church and other normal agencies fail.

Judge Cornelius F. Collins: Children's courts

have grown up throughout the whole country which have made marked progress and achieved important success, performing their functions with conspicuously successful results in the direction of prevention . . . and permanent reformation. The scope of these courts includes the whole of the domestic relations, husband and wife, parent and child, guardian and ward, and their interrelations and government.

Charles L. Chute: We now have juvenile court laws in every state but two. Sometimes they are called children's courts, as in New York State, and in recent years some of them have become domestic relations courts, with a broader jurisdiction, to deal not only with children but with parents. We have had a mass of legislation on this subject, but it is still quite inadequate and not uniform. Age limits vary, jurisdiction to deal effectively with parents is often lacking, and, worst of all, in many states the juvenile court has only a partial jurisdiction.

School Experience

Frank J. O'Brien: One of the greatest needs in schools to-day is for more . . . individualization. . . . If a person enters a hospital or puts himself under the care of his private physician, he is not treated en masse with others of the same age or profession, . . . and yet in . . . the education of our children—we continue, for the most part, to use those methods of mass education, which have been employed for decades. . . .

Individualization, based upon a knowledge of each child, . . . is . . . expensive as compared with the cost under our present methods. When we actually believe the fact that the misfits in school . . . make up in large measure our big army of juvenile delinquents and later form a very large percentage of the criminal group, the true significance of the so-called "different" child . . . becomes more evident. When we reason a step further and realize the cost to society of these social misfits as represented by the budgets for running our courts, probation departments and institutions, not to mention the costs as represented by the police department, district attorney's office, houses of detention, loss of life and property and human productivity, we can rightfully ask, "how can we continue to be satisfied with the results we are obtaining to-day?"

EDUCATIONAL RESEARCH AND STATISTICS

SPECIAL CLASSES FOR PHYSICALLY AND MENTALLY HANDICAPPED PUPILS

In 1915 certain special classes for handicapped children in Minnesota public schools began to receive state aid. The statute of that year applied to the deaf, the blind, the mentally subnormal and the defective in speech. The last-mentioned group is not under consideration in this study. In 1921 similar aid was extended to classes for crippled children. The state aids studied herein are given to school districts upon a per pupil basis, according to amounts specified in the statutes. These amounts are now prorated according to a subsequent statute, due to large demands for state aids in other public school work. The tables submitted indicate, consequently, the prorated sums for special class aids. The first is designated as Table I.

Factual Trends

Observation of the data in Table I reveals the fact that the peak of total expenditures for special classes having mentally subnormal children was reached during 1930–1931, while the greatest amount for state aid given such classes occurred in the previous year. It should be observed also that in the latter year the state aid sum was 59.2 per cent. of all expenditures for that year and that a year later, when total expenditures reached the peak, the ratio was 57.0 per cent. The latter percentage was but in excess of the last and the lowest percentage for the decade, which began with 79.6 per cent. and, with one exception, decreased with each succeeding year.

It should not be assumed, however, that local communities were carrying voluntarily a greater share of the cost burden as the years advanced. The truth may be that the state aid appropriations for this type of work were fairly constant from one biennium to the other. It is true, moreover, that prorating established by law for special classes as well as other types of public school endeavor is a factor which needs consideration here. This fact is illustrated in the succeeding tables by the increasing amounts for state aid in the other types of special classes for successive years, noticeably in the later years of the period.

The number of school systems apparently has

TABLE I

A DISTRIBUTION SHOWING TOTAL EXPENDITURES, STATE AID AND PERCENTAGES, TOGETHER WITH NUMBERS OF SCHOOL SYSTEMS, TEACHERS AND PUPILS ENROLLED IN SPECIAL CLASSES FOR THE MENTALLY SUBNORMAL IN MINNESOTA PUBLIC SCHOOLS DURING THE YEARS 1923–1932

Year	Total expenditures[a]	State aid[a]	Per cent. of total expenditures	Number		
				School systems	Teachers	Pupils enrolled
1922–1923	$ 258,825	$ 206,086	79.6	42	148	2,460
1923–1924	288,051	213,089	73.9	44	156	2,609
1924–1925	321,317	217,309	67.6	47	171[e]	2,825
1925–1926	342,007	231,616	67.7	48	183[f]	2,982
1926–1927	369,874	240,257[b]	64.9	50	197[g]	3,307
1927–1928	377,096	238,191	63.1	49	202[h]	3,278
1928–1929	387,252	243,330[c]	62.8	47	207[i]	3,334
1929–1930	410,535	243,405	59.2	46	218[j]	3,419
1930–1931	415,621	237,119[d]	57.0	45	213[k]	3,400
1931–1932	410,929	226,119	55.0	43	209[e]	3,322
Total	$3,581,507	$2,296,521	64.1			(av.)3,093.6

[a] Amount to nearest dollar.
[b] Including $1,056 earned in 1925–1926.
[c] Including $90 earned in 1927–1928.
[d] Including $90 earned in 1929–1930.
[e] Including two part-time teachers.
[f] Including one assistant, one part-time teacher and one full-time teacher for less than one year.
[g] Including one assistant and one part-time teacher.
[h] Including one part-time teacher and one full-time teacher for less than one year.
[i] Including one part time teacher and three full-time teachers for less than one year.
[j] Including one part-time teacher and four full-time teachers for less than one year.
[k] Including one part-time teacher.

little or no relation to total expenditures or state aid for this type of work, since the peak was reached in the fifth year of the decade with receding numbers thereafter. The number of teachers and the pupil load, with one exception in the latter group, increased annually up to and including the year 1929–1930, decreasing somewhat in the two remaining years of the decennium.

Consideration of the data in Table II shows, with one exception, an increasing annual total expenditure for special education of the deaf

TABLE II

A DISTRIBUTION SHOWING TOTAL EXPENDITURES, STATE AID AND PERCENTAGES, TOGETHER WITH NUMBERS OF SCHOOL SYSTEMS, TEACHERS AND PUPILS ENROLLED IN SPECIAL CLASSES FOR THE DEAF IN MINNESOTA PUBLIC SCHOOLS DURING THE YEARS 1923–1932

Year	Total expenditures[a]	State aid[a]	Per cent. of total expenditures	Number		
				School systems	Teachers	Pupils enrolled
1922–1923	$ 21,650	$ 21,568	99.6	4	12	104
1923–1924	25,676	24,566	95.2	4	14	111
1924–1925	29,894	29,238	97.8	4	16	141
1925–1926	34,916	31,274	89.5	4	17	146
1926–1927	37,928	36,432	96.0	4	18	162
1927–1928	37,694	34,440	91.3	4	18	159
1928–1929	38,410	34,213	89.0	4	19	167
1929–1930	39,337	34,004	86.4	5	20	186
1930–1931	47,212	40,763	86.3	6	21	196
1931–1932	44,462	37,436	84.1	6	20	206
Total	$357,179	$323,934	90.6			(av.)157.8

[a] Amount to nearest dollar.

TABLE III

A DISTRIBUTION SHOWING TOTAL EXPENDITURES, STATE AID AND PERCENTAGES, TOGETHER WITH NUMBERS OF SCHOOL SYSTEMS, TEACHERS AND PUPILS ENROLLED IN SPECIAL CLASSES FOR THE BLIND IN MINNESOTA PUBLIC SCHOOLS DURING THE YEARS 1923–1932

Year	Total expenditures[a]	State aid[a]	Per cent. of total expenditures	Number		
				School systems	Teachers	Pupils enrolled
1922–1923	$ 30,445	$ 30,115	98.9	5	16	138
1923–1924	36,495	36,126	98.9	5	19	154
1924–1925	44,317	40,999	92.5	5	23[b]	205
1925–1926	47,581	41,516	87.2	5	23[b]	213
1926–1927	48,928	44,957	91.8	5	23[b]	213
1927–1928	50,122	46,312	92.3	6	24[b]	225
1928–1929	50,200	45,864	91.3	6	23[b]	213
1929–1930	52,886	46,295	87.5	6	25[c]	224
1930–1931	53,160	48,019	90.3	6	24[d]	231
1931–1932	54,393	47,431	87.2	7	24	233
Total	$468,527	$427,634	91.2			(av.) 204.9

[a] Amount to nearest dollar.
[b] Including two part-time teachers.
[c] Including two part-time teachers and three teachers for less than one year.
[d] Including two part-time teachers and one teacher for less than one year.

in Minnesota public schools up to and including the year 1930–1931, the next to the last year of the period studied. State aid amounts show successive annual increases for the first five years, with fairly constant amounts for the next three years, and with the crest reached in the same year as that of total expenditures. The percentages which state aid sums annually bear to the other begin with 99.6 and close with 84.1, decrease being consistent for seven out of nine years. The number of school systems probably has significance after the eighth year. There is a consistent increase in the enrolment year by year and consequently in the number of teachers. This has definite bearing upon total expenditure.

The data presented in Table III are concerned with the progress of special classes for the blind in Minnesota public schools. Total expenditures for the period increased consistently for each year, showing that the sum for the last year was approximately 80 per cent. greater for that year than for the first. Substantial increases in state aid appeared annually for the first six years with slight decreases for the next two years, but with the peak of such aid reached in the ninth year. The percentages which state aids are of total expenditures vary, after the second year, from decrease to increase and back again until 87.2 is indicated for the final year. The slow growth in number of school systems may not be as important in relation to total expenditures as pupil enrolment, increase and size of the teaching personnel. Pupils enrolled had increased approximately 60 per cent. during the decennium.

The growth of special instruction and care of crippled children in Minnesota public schools during this period, while limited to no more than three large school systems, presents an interesting development in this field. The data are indicated in Table IV. Total expenditures were considerably more than trebled during the decade, while state aid was doubled generously. The increases were fairly consistent with the former, but less so for the latter. Pupils enrolled and numbers of teachers were more than doubled during the period.

SUMMARY AND CONCLUSIONS

(1) The grand total expenditures for the four types of state-aided special classes for defectives in Minnesota public schools reached the sum of $4,917,599 for the ten-year period.

The grand total state aid of $3,435,301 for such classes was 69.8 per cent. of the grand total expenditures.

The total expenditures of $3,581,507 for mentally subnormal children in this period was 72.8 per cent. of the grand total expenditures.

TABLE IV

A DISTRIBUTION SHOWING TOTAL EXPENDITURES, STATE AID AND PERCENTAGES, TOGETHER WITH NUMBERS OF SCHOOL SYSTEMS, TEACHERS AND PUPILS ENROLLED IN SPECIAL CLASSES FOR THE CRIPPLED IN MINNESOTA PUBLIC SCHOOLS DURING THE YEARS 1923–1932

Year	Total expenditures[a]	State aid[a]	Per cent. of total expenditures	Number		
				School systems	Teachers	Pupils enrolled
1922–1923	$ 26,509	$ 26,509	100.0	1	8	143
1923–1924	31,246	30,833	98.6	1	10	140
1924–1925	37,759	29,734	78.7	1	11[b]	156
1925–1926	31,347	28,839	91.9	1	12[b]	186
1926–1927	45,030	36,877	81.8	2	13[b]	217
1927–1928	58,291	41,005	70.3	2	14[b]	218
1928–1929	58,951	36,320	61.6	2	14[b]	241
1929–1930	69,712	47,872	68.6	2	15[c]	247
1930–1931	66,798	50,255	75.2	2	14[c]	266
1931–1932	84,743	58,968	69.5	3	19[c]	367
Total	$510,386	$387,212	75.8			(av.)218.1

[a] Amount to nearest dollar. [b] Including one part-time teacher. [c] Including two part-time teachers.

The total state aid of $2,296,521 for mentally subnormal children in special classes was 66.8 per cent. of the grand total state aid.

(2) With five exceptions in the four types of special classes for defectives throughout this period, the total expenditures increased for each succeeding year.

The increases in state aid for such classes in the same period appeared less often. There were twelve exceptions to the tendency to increase.

State support became noticeably less for mentally subnormal children and crippled children in these classes during the more recent years of the decade.

The number of school systems in itself probably was not significant, except as it might have affected total expenditures for crippled children.

The number of teachers increased with the enrolment, which in turn directly affected total expenditure. Owing to the prorating feature of the statute, however, the state aid did not increase in the same proportion as did the total expenditure.

IMPLICATIONS OF THIS STUDY

The data presented in this study and the conclusions regarding their significance lead one to a consideration of three problems for immediate and future study. These are indicated as follows:

(1) Questions of public educational policy involving administrative principles and the philosophy underlying public education are being asked as to (a) the relationship of special classes to the larger program of public education, (b) the effect upon special classes if administrative policies change and if a new philosophy of education is evolved.

(2) Retrenchment policies in public education as well as in other fields have become general, probably for an indefinite period. If retrenchment for special classes is imperative, to what types should it be applied?

(3) A study of the practical outcomes of special classes is as necessary as it is desirable. At no time has it been as essential as at present. Such inquiry is applicable to state-aided and non-state-aided classes alike. A recent study suggesting what may be attempted commends itself for consideration to the personnel of bureaus of research or others in position to undertake such endeavor.[1]

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[1] Alice Channing, "Employment of Mentally Deficient Boys and Girls," U. S. Department of Labor, Children's Bureau. Publication No. 210.

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